What is claimed is:

1. A method of compensating for lost packets in a packet based voice communication system, comprising the steps of:

storing successive packets of a packetized voice signal;

detecting a missing voice packet from said voice signal;

estimating the power spectrum $P(\omega)$ of a stored one of said packets previous to said missing voice packet;

creating a filter with transfer function $|H(\omega)|^2 = P(\omega)$;

applying white noise to said filter for generating a noise packet which has the same power spectrum as said stored one of said packets; and

inserting said noise packet in said voice signal to replace said missing voice packet.

2. The method of claim 1, wherein said step of estimating said power spectrum comprises performing Welch's averaged periodogram method on said stored one of said packets.

3. A system to compensate for lost packets in a packet based voice communication system, comprising:

a buffer for storing successive packets of a packetized voice signal;

a packet loss detector for detecting a missing voice packet from said voice signal;

a power spectrum estimator for estimating the power spectrum $P(\omega)$ of a stored one of said packets previous to said missing voice packet;

a filter coefficients generator for receiving said power spectrum from said power spectrum estimator and in response creating a filter with transfer function $|H(\omega)|^2 = P(\omega)$;

a white noise generator for applying white noise to said filter which in response generates a noise packet which has the same power spectrum as said stored one of said packets; and

a switch operable by packet loss detector for inserting said noise packet in said voice signal to replace said missing voice packet.

4. The system of claim 3, further comprising an additional switch operable by said packet loss detector and connected between said buffer and said power spectrum estimator.

5. The system of claim 3, wherein said power spectrum estimator implements Welch's averaged periodogram method on said stored one of said packets.